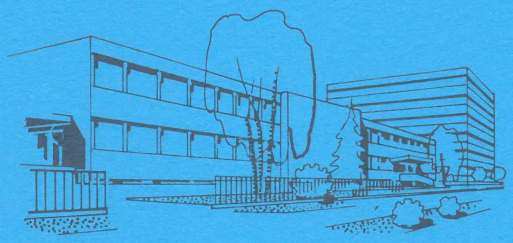
ADRET



CALIBRATION MAINTENANCE

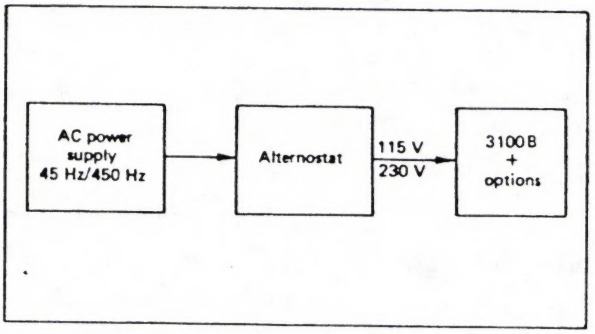
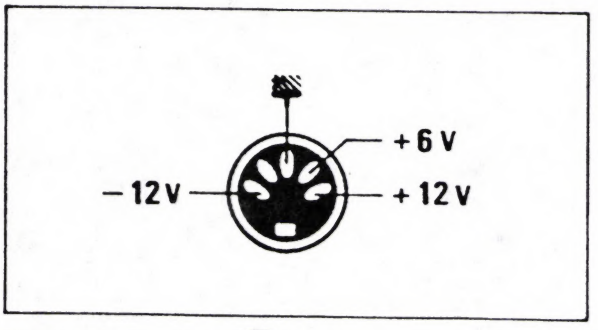
ADRET
Schlumberger

12, avenue Vladimir Komarov • B.P. 33 78192 Trappes Cédex • France • Tél. 30.51.29.72
Telefax 30.51.00.74 • Télex ADREL 697821 F • Siret 679805077-00048 • CCP Paris 21 797 04

The tests described in the following pages will assure the user that the instrument corresponds to the technical characteristics stated in chapter II. These tests can be made as input inspection, periodical checking of the performances, or control of the characteristics following repairs made on the instrument.

INSTRUMENTS REQUIRED FOR THE TESTS

TYPE OF INSTRUMENT	REFERENCE	SPECIFICATIONS
Alternostat		0 V to 260 V , 200 W.
Multimeter	FLUKE 8000A	DC/AC , $\pm$ 1 % accuracy.
Oscilloscope	H.P. 180C + 1808A + 1820C	75 MHz bandwidth
Frequencymeter	SCHLUMBERGER FH 2523	10 Hz to 500 MHz , 9 digits.
RF voltmeter	H.P. 3406A	10 kHz to 1.2 GHz , $\pm$ 3 % accuracy.
Milliwattmeter	WANDEL & GOLTERMANN	10 kHz to 300 MHz $\pm$ 0.015 dB accuracy
Phasemeter	DRANETZ 305-PA-3002	2 Hz to 700 kHz , $\pm$ 0.1° accuracy.
Spectrum analyzer (panoramic)	H.P. 180C + 8558B	0.1 MHz to 1.5 GHz , 70 dB dynamic range.
Spectrum analyzer (high resolution)	ADRET 6100 + 6303 + 6503	10 Hz to 110 MHz , 120 dB dynamic range.
X-Y recorder	H.P. 7041A	76 cm/s speed
Frequency Standard	ADRET 4101	Standard Receiver , $\pm$ 5.10^{-10}/24 h stability.
Frequency Error Multiplier	ADRET 4110	10^{-8} to 10^{-12} resolution
DC Source	ADRET 102	$\pm$ 5.10^{-5} accuracy , 50 mA output current.

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
1	VISUAL CONTROL Check the external aspect of the instrument and make sure that protection fuses (F1) and (F2) have a 250 mA value.	
2 115 V - 230 V 45 Hz to 450 Hz power supply Alternostat Multimeter	AC LINE REGULATION Feed the instrument with a 45 Hz/450 Hz power supply and an alternostat as shown in figure VII-1.  *Figure VII-1 AC LINE REGULATION* a) Make the supply frequency vary from 45 Hz to 450 Hz successively on the 115 V and 230 V mains voltages. Measure the available voltages on socket (S01) (see figure VII-2) on the rear panel : + 12 V with regard to ground - 12 V with regard to ground + 6 V with regard to ground. b) Repeat the preceding test making the voltage vary from ± 10 % through the alternostat successively on the 115 V and 230 V ranges.  *Figure VII-2 SOCKET (S01)*	Accuracy : ± 100 mV ± 100 mV ± 150 mV The + 12 V, - 12 V and + 6 V voltages must remain identical within ± 1 mV.

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
	c) Using the multimeter, measure the current absorbed by the instrument on the two mains voltages. Apply the formula : P = U.I giving the apparent power consumed.	P < 40 VA
3 AC power supply Alternostat 250 Hz low-pass filter Oscilloscope	RESIDUAL LF SIGNAL The instrument being powered at a 50 Hz frequency, measure through the oscilloscope and the 250 Hz low-pass filter the residual LF signal present on the + 12 V, + 6 V and - 12 V voltages delivered by socket (S01).	Residual signal : < 3 mVp-p
4 Frequencymeter	OUTPUT FREQUENCY a) Local mode : The frequencymeter and the 3100B synthesizer being driven by the same 10 MHz reference frequency, check through the frequencymeter that the frequency delivered by connector (J1) is that dialled on switches (K1). b) Remote mode : The frequencymeter and the 3100B synthesizer being driven by the same reference, check through the frequencymeter that the frequency delivered by connector (J1) is that programmed on connector (S02).	
5 Multimeter RF Voltmeter Oscilloscope	OUTPUT LEVEL a) DC content Dial on switches (K1) a 10 kHz frequency and select on channels A and B a sine wave of e.m.f. calibrated at 7 Vpeak and 50 Ω output impedance.	

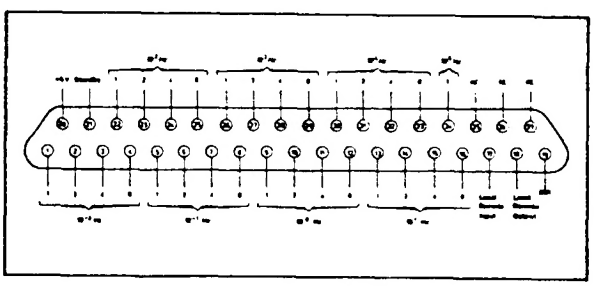
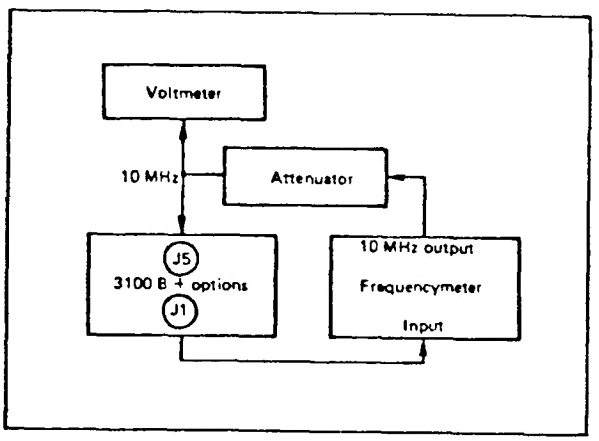
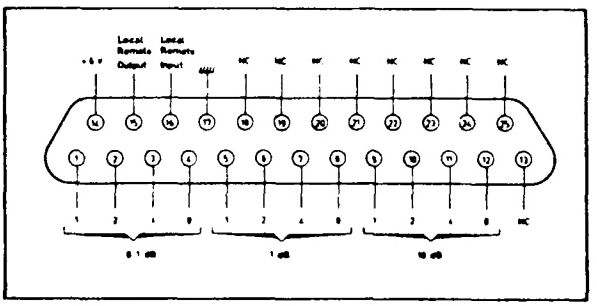


Figure VII-3 CONNECTOR (S02)

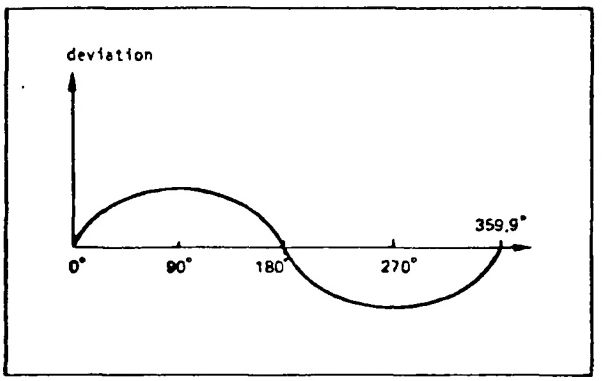
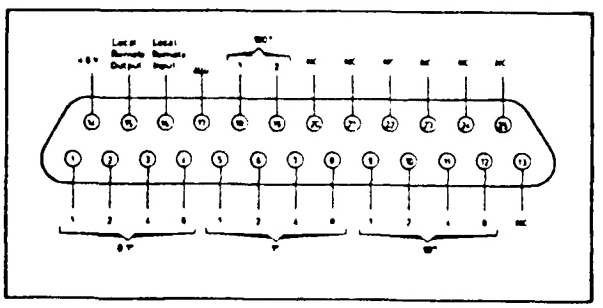
N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
	Check with the multimeter that the DC content of the sine wave delivered by connectors (J1) and (J2) does not exceed 100 mV. In the opposite case, operate potentiometers P3 (channel A) and P2 (channel B) of the Output Mixer.	DC content : < 100 mV
	b) Sine wave calibration Dial a 10 kHz frequency and select on channels A and B a sine wave of e.m.f. calibrated at 7 Vpeak and 50 Ω output impedance. Measure through the RF voltmeter the level of the signal delivered by connectors (J1) and (J2) on a 50 Ω load. The calibration of this level is performed through potentiometer P1 of the Output Mixer.	Calibrated level : 2.5 Vrms/50 Ω ± 100 mVrms
	c) Square Wave calibration Dial a 10 kHz frequency and select on channel A an e.m.f. calibrated at 7 V peak and a 50 Ω output impedance. Through the oscilloscope, successively measure the amplitude of the positive, negative and symmetrical square wave delivered by connector (J1) on a 50 Ω load. Measure also the electromotive force of the TTL square wave delivered by connector (J1).	Positive or negative square wave : 3.5 Vp-p/50 Ω ± 5 % TTL square wave : 7 Vp-p/50 Ω ± 5 % TTL square wave : 4.2 Vp-p e.m.f. + 5 %
	d) Duty cycle of square waves : Measure through the oscilloscope the duty cycle of the different square waves delivered by connector (J1).	Duty cycle : 50 % ± 2 %
6 RF Voltmeter	AMPLITUDE/FREQUENCY RESPONSE Select on channels A and B a sine wave of e.m.f. calibrated at 7 Vpeak and 50 Ω impedance. Match the (J1) and (J2) outputs with a 50 Ω load and measure through the voltmeter the output level variations with regard to the level delivered at 10 kHz.	Amplitude/frequency response : ± 3 %
7 RF Voltmeter	ATTENUATOR CONTROL Dial a 199.999 kHz frequency on switches (K1) and select on channel A of the synthesizer a sine wave of e.m.f. calibrated at 7 Vpeak and 50 Ω impedance.	

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
	Measure with the voltmeter the level of the signal delivered by connector (J1) on a 50 Ω load when the attenuation selected by switch (K8) varies from 0 dB to 70 dB.	Signal attenuation : 10 dB ± 0.5 dB 20 dB ± 1 dB 30 dB ± 1.5 dB 40 dB ± 2 dB 50 dB ± 2.5 dB 60 dB ± 3 dB 70 dB ± 3.5 dB
8 RF Voltmeter	MASTER OSCILLATOR OUTPUT Switch (K10) being on the "External" position, measure through the voltmeter the level of the 10 MHz signal delivered by connector (J5) on a 50 Ω load.	 Level : 100 mVrms/50 Ω
9 Frequencymeter RF Voltmeter Attenuator	EXTERNAL REFERENCE DRIVING Set switch (K10) on "External" and drive the 3100B synthesizer by applying to connector (J5) the 10 MHz reference issued from the frequencymeter, as shown in figure VII-4.	
	 *Figure VII-4 EXTERNAL REFERENCE DRIVING*	
	Through the attenuator, reduce the level of the signal applied to connector (J5) until the 3100B synthesizer ceases operating properly. Increase this level again and measure through the voltmeter the minimal level permitting a correct functionning of the instrument.	Minimal level : 50 mVrms/50 Ω

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
10	MASTER OSCILLATOR STABILITY	
Frequency standard Frequency error Multiplier	Through the error multiplier, measure the $\Delta F/F$ relative difference between the 10 MHz frequency available on connector (J5) and the reference delivered by the Frequency Standard. The synthesizer remaining under power, measure the $\Delta F'/F$ relative difference between these two frequencies after 24 hours'continuous operation.	$\left\lvert \frac{\Delta F'}{F} - \frac{\Delta F}{F} \right\rvert < 5.10^{-7}$ after 8 hours'continuous operation.
11	HARMONIC AND NON-HARMONIC CONTENT	
Spectrum analyzer (panoramic)	Select on channels A and B a sine wave of e.m.f. calibrated at 7 Vpeak and 50 Ω impedance.	
	The (J1) and (J2) outputs being loaded by a 50 Ω impedance, measure through the spectrum analyzer the harmonic and non-harmonic components of the output signal of channels A and B for different frequencies.	Harmonic signals : < - 50 dB Non-harmonic signals : < - 70 dB
12	PHASE NOISE	
Spectrum analyzer (high resolution) X-Y recorder	Dial a 100 kHz frequency on Switches (K1) and select on channel A or B a sine wave of 2 Vpeak e.m.f. and 50 Ω impedance.	
	Through the spectrum analyzer and the X-Y recorder, note the phase noise in a 1 Hz band at 100 Hz, 1 kHz and 10 kHz from carrier.	Phase noise in a 1 Hz band : - 110 dB at 100 Hz - 115 dB at 1 kHz - 125 dB at 10 kHz
13	PHASE-SHIFT	
Phasemeter	Select on channels A and B a sine wave of e.m.f. calibrated at 7 Vpeak and 50 Ω impedance.	
	Connect the phasemeter on the (J1) and (J2) outputs through two coaxial cables of same length terminated by a 50 Ω load. Measure the phase-shift between these two outputs for different values of the synthesized frequency.	Channel A/Channel B phase-shift : 90° ± 0.5°

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
	OPTION 3111B	
1 RF Voltmeter Milliwattmeter	ATTENUATION CONTROL Dial on the 3100B synthesizer a 199.999 kHz frequency and select on channel A a sine wave of 50 Ω output impedance. Interlink connector (J1) of the synthesizer with connector (J11) of option 3111B, and connect the RF voltmeter or the milliwattmeter on connector (J12) while ensuring the impedance matching. For different values of the attenuation, measure the deviation between the attenuation really brought to the signal of the synthesizer and the value set on switches (K11), (K12) and (K13).	Attenuation accuracy : • 0.1 dB steps : ± 0.05 dB • 1 dB steps : ± 0.1 dB • 10 dB steps : ± 0.2 dB
2 RF Voltmeter Milliwattemeter	CONTROL OF PROGRAMMING Switch (K13) being set in "Remote" position, check the concordance between the attenuation brought by option 3111B and the value programmed on connector (S011).  *Figure VII-5 CONNECTOR (S011)*	
3 Phasemeter	PHASE-SHIFT INTRODUCED BY THE ATTENUATOR Dial on the synthesizer a 199.999 kHz frequency and select on channel A a sine wave of e.m.f. calibrated at 7 Vpeak and of 50 Ω impedance. Interlink connector (J1) with connector (J11) with a coaxial cable as short as possible and connect the phase-meter to the (J11) and (J12) outputs through two coaxial cables of the same length. The phase-shift introduced by the attenuator must be less than ± 2°.	Maximum phase-shift at 200 kHz : ± 2°

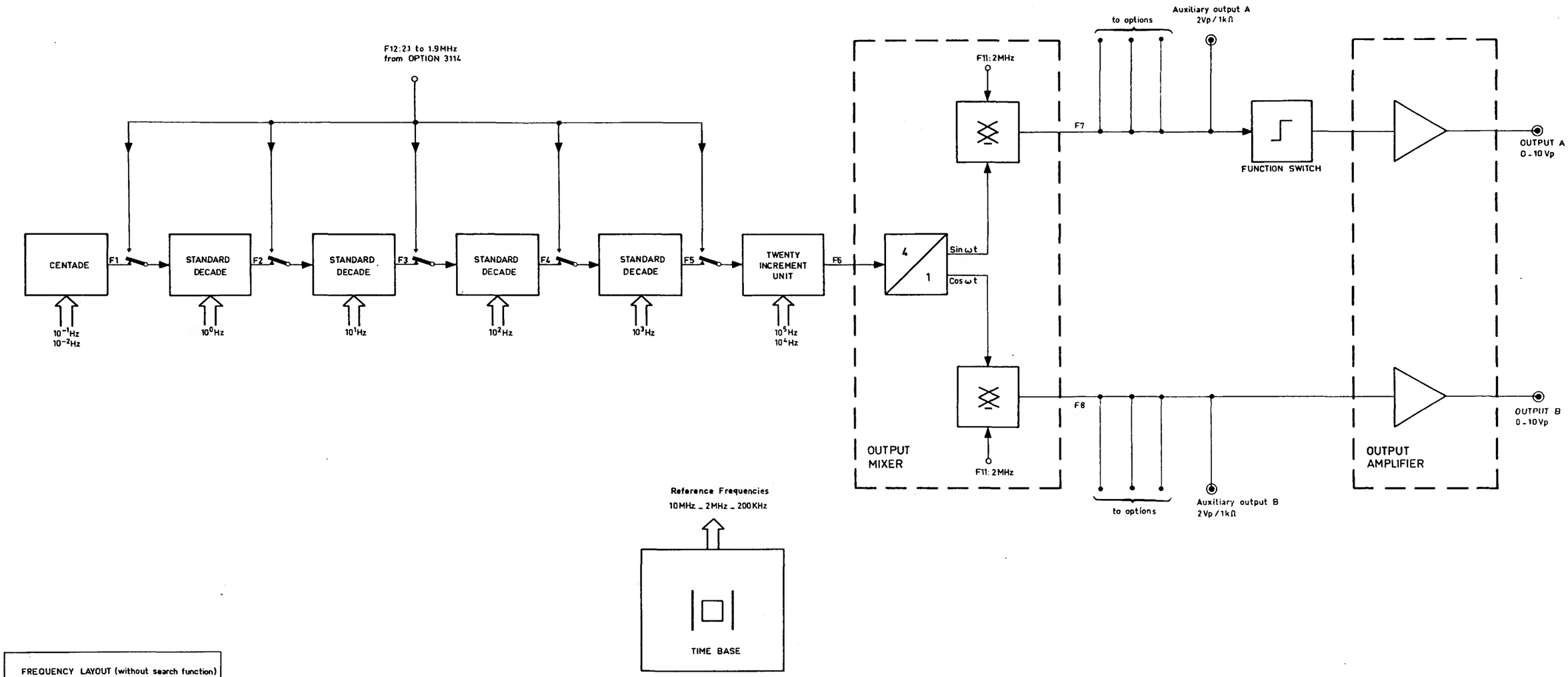
N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
	OPTION 3112B	
1	OUTPUT LEVEL	
RF voltmeter Multimeter	Dial on the 3100B synthesizer a 10 kHz frequency and select on the 3112B option an e.m.f. calibrated at 7 Vpeak and a 50 Ω output impedance.	
	a) DC content : Through the multimeter, check that the DC content of the signal delivered by connector (J21) does not exceed ± 100 mV.	DC content : < 100 mV
	b) Calibration : Measure through the voltmeter the level of the signal delivered at a 50 Ω load by connector (J21). The calibration of this level is performed through potentiometer P4 of the Output Circuit (plate VI-18).	Calibrated level : 2.5 Vrms/50 Ω ± 5 %
2	AMPLITUDE/FREQUENCY RESPONSE	
RF Voltmeter	Select on the 3112B option an e.m.f. calibrated at 7 Vpeak and a 50 Ω output impedance. The (J21) output being loaded by a 50 Ω impedance, measure through the voltmeter the output level variations compared with the level delivered at 10 kHz.	Amplitude/Frequency response : ± 3 %
3	PHASE-SHIFT	
Phasemeter	Select on channel A of the 3100B and on option 3112B a sine wave of e.m.f. calibrated at 7 Vpeak and of 50 Ω output impedance. Connect the phasemeter to the (J1) and (J21) outputs through two coaxial cables of same length terminated by a 50 Ω load.	
	a) Linearity Dial a 1 kHz frequency on the synthesizer. Vary the phase-shift from 0° to 359.9° and measure the deviation between the value displayed by switches (K21) and the phase-shift indicated by the phasemeter. If this deviation exceeds ± 1°, successively operate potentiometers P1 (general adjustment), P3(0° and 180° adjustment), P5 (90° and 270° adjustment) and P4 (45°, 135°, 225° and 315° adjustment) of the Generation sin ϕ/cos ϕ subassembly (plate VI-17).	Linearity : ± 1°

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
	Figure VII-6 shows the deviation curve as a function of the phase-shift when the instrument is correctly adjusted.	
		
	Figure VII-6 PHASE-SHIFT LINEARITY	
	Then dial a 199 kHz frequency on the synthesizer and plot the deviation curve as a function of the phase-shift. If this deviation exceeds ± 1°, operate capacitor C2 of the Output Circuit (plate VI-18).	
	b) Phase/frequency response	
	Dial 45° on switches (K21) and measure with the phasemeter the phase-shift variation as a function of the synthesized frequency.	Phase/frequency response : ± 1°
4	CONTROL OF PROGRAMMING	
Phasemeter	Select on channel A of the 3100B and on option 3112B a sine wave of e.m.f calibrated at 7 Vpeak and of 50 Ω output impedance.	
	Connect the phasemeter to the (J1) and (J21) outputs through two coaxial cables of same length terminated by a 50 Ω load.	
	The "Local/Remote" key (K24) being pressed, dial on the 3100B a 10 kHz frequency and check the concordance between the phase-shift programmed on connector (S012) and the value measured by the phasemeter.	
		
	Figure VII-7 CONNECTOR (S012)	

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
5 RF Voltmeter	AMPLITUDE/PHASE RESPONSE Dial on the 3100B a 199 kHz frequency and select on option 3112B an e.m.f. calibrated at 7 Vpeak and a 50 Ω impedance. The (J21) output being matched by a 50 Ω load, measure through the voltmeter the output level variations when the phase-shift varies from 0° to 359.9°.	 Amplitude/phase response : ± 0.25 dB
6 Spectrum analyzer (panoramic)	HARMONIC AND NON-HARMONIC CONTENT Select on option 3112B an e.m.f. calibrated at 7 Vpeak and a 50 Ω impedance. The (J21) output being matched by a 50 Ω load, measure through the spectrum analyzer the harmonic and non-harmonic components of the output signal for different frequencies.	 Harmonic signals : < - 45 dB Non-harmonic signals : < - 65 dB
7 Spectrum analyzer (high resolution) X-Y Recorder	PHASE NOISE Dial a 100 kHz frequency on the 3100B and select on option 3112B a sine wave of 2 Vpeak e.m.f. and 50 Ω impedance. Through the spectrum analyzer and the X-Y recorder, note the phase noise in a 1 Hz band at 100 Hz, 1 kHz and 10 kHz from carrier.	 Phase noise in a 1 Hz band: - 110 dB at 100 Hz - 115 dB at 1 kHz - 115 dB at 10 kHz

N° d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
	OPTION 3114B	
1 Oscilloscope	SWEEP AMPLITUDE Set switch (K45) on 0.01 s and select the sweep by symmetrical triangles through keyboard (K41). Check with the oscilloscope the centering with regard to 0 V of the sweep triangles delivered by (J41). The amplitude of these triangles must be 10 Vp-p ± 10 %.	Amplitude : 10 Vp-p ± 10 %
2 Oscilloscope	START/STOP CONTROL Set switch (K45) on 10 s and select the sawtooth sweep through keyboard (K41). a) START control : With the oscilloscope, check that grounding socket (J46) or pressing "Start" key (K42) starts the sawtooth delivered by connector (J41). b) STOP control : Check that grounding socket (J47) or pressing "Stop" key (K43) brings back to - 5 V the sawtooth delivered by (J41). c) TRACE output : With the oscilloscope, check that "Trace" output (J45) delivers about 0 V when the sawtooth rises and about + 12 V when it returns to - 5 V.	
3 Oscilloscope chronometer	SWEEP DURATION Select the sweep by symmetrical triangles and measure with the oscilloscope the half-period of these triangles for a sweep duration between 0.01 s and 1 s. Then, select the sawtooth sweep and measure with the chronometer the duration of this sawtooth for a sweep duration between 3 s and 300 s. In both cases, the difference between the indication of switch (K45) and the duration measured must be less than ± 20 %.	Accuracy : ± 20 %.

N°d'ESSAI appareils utilisés	CONDITIONS	SANCTIONS
4 Frequencymeter	INTERPOLATION ACCURACY Dial a 0 Hz frequency on the 3100B and select a ± 10 kHz interpolation range through keyboard (K44). Center the interpolation oscillator through potentiometer (P43), then check the accuracy of the graduations on graduated scale (DS41) for different positions of potentiometer (P41). This measurement can also be achieved by connecting the frequencymeter to the 5 MHz ± 1 MHz output.	Accuracy : ± 5 %
5 RF Voltmeter	5 MHz ± 1 MHz OUTPUT LEVEL Connect the voltmeter to connector (J42) loaded with a 50 Ω impedance and measure the level of the 5 MHz ± 1 MHz signal when the frequency varies from 4 MHz to 6 MHz.	Level : 200 mVrms/50 Ω ± 100 mVrms
6 Frequencymeter Source	EXTERNAL SWEEP Select the external sweep through keyboard (K41) and apply a - 5 V to + 5 V DC voltage to connector (J41). Make this voltage vary by 0.5 V steps and check through the frequencymeter that the frequency of the signal delivered by (J42) varies from 4 MHz to 6 MHz in 100 kHz steps.	



FREQUENCY LAYOUT (without search function)

F1: 2MHz to 1.901MHz

F2: 2MHz to 1.9001MHz

F3: 2MHz to 1.90001 MHz

F4: 2MHz to 1.900001MHz

F5: 2MHz to 1.9000001MHz

F6: 8MHz to 7.20000004MHz

F7: 0.01Hz to 199.99999 kHz

F8: 0.01Hz to 199.99999kHz

Dispersion range display (with option 3114 B) indicating the inhibition of the digits located on the right of the lit LED.

DS2

Selection of impedance and attenuation of main output A.

- 50 Ω impedance : 0 to 70 dB attenuation in 10 dB steps.
- 5 Ω impedance : no attenuation.

K8

Main output A

J1

Rotary switches selecting the synthesized frequency.

K2

- Key released (Local mode) : Selection of synthesized frequency through switches **K2**.
- Key pressed (Remote mode) : Remote programming of synthesized frequency.

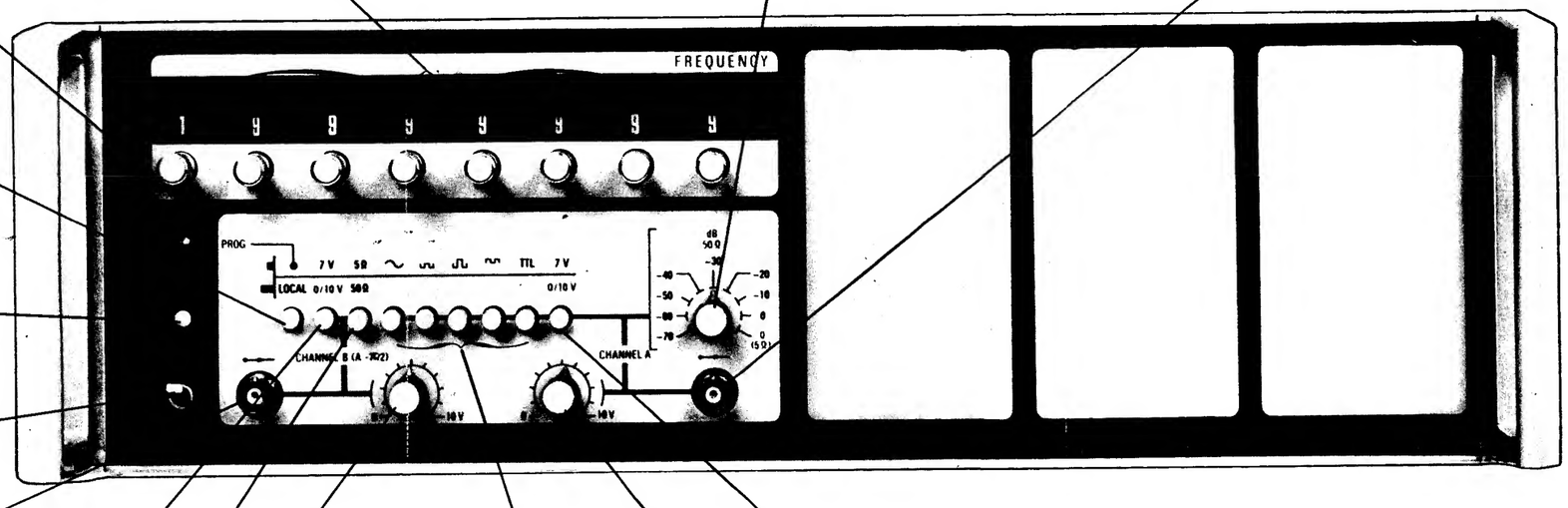
K3

«On» indicator light

DS1

«On/Off» switch

K1



Main output B, phase-shifted from + 90° with respect to output A.

J2

P2

K6

K7

- Key released : Electromotive force of main output A adjustable from 0 to 10 Vpeak through potentiometer **P1**.
- Key pressed : Electromotive force of main output A calibrated at 7 Vpeak.

NB : This key in inhibited when a TTL square wave is selected on keyboard **K6**.

- Key released : Electromotive force of main output B adjustable from 0 to 10 Vpeak through potentiometer **P2**.
- Key pressed : Electromotive force of main output B calibrated at 7 Vpeak.

K4

Waveform selection (main output A)

- Key ∿ pressed : sine wave
- Key ⊓ pressed : symmetrical square wave
- Key ⊓ pressed : negative square wave
- Key ⊓ pressed : positive square wave
- Key TTL pressed : TTL square wave

P1

Adjustment of output level delivered by connector **J1** (key **K7** released).

- Key released : Main output B impedance : 50 Ω
- Key pressed : Main output B impedance : 5 Ω

K5

Adjustment of output level delivered by connector **J2** (key **K4** released).

3100 B FRONT-PANEL DESCRIPTION

PLATE V-1

- Switch **K10** on **Int.** :
  Output of 10 MHz internal reference.
  Level : 100 mVrms/50 Ω approximately.
- Switch **K10** on **Ext.** :
  Input of 10 MHz external reference.
  Level required : 50 mVrms to 1 Vrms/50 Ω.

Internal/External switch.

- **Int.** position :
  Synthesizer driving by Time Base crystal oscillator, whose 10 MHz frequency is available on connector **J5.**
- **Ext.** position :
  Synthesizer driving by 10 MHz external reference applied to connector **J5.**

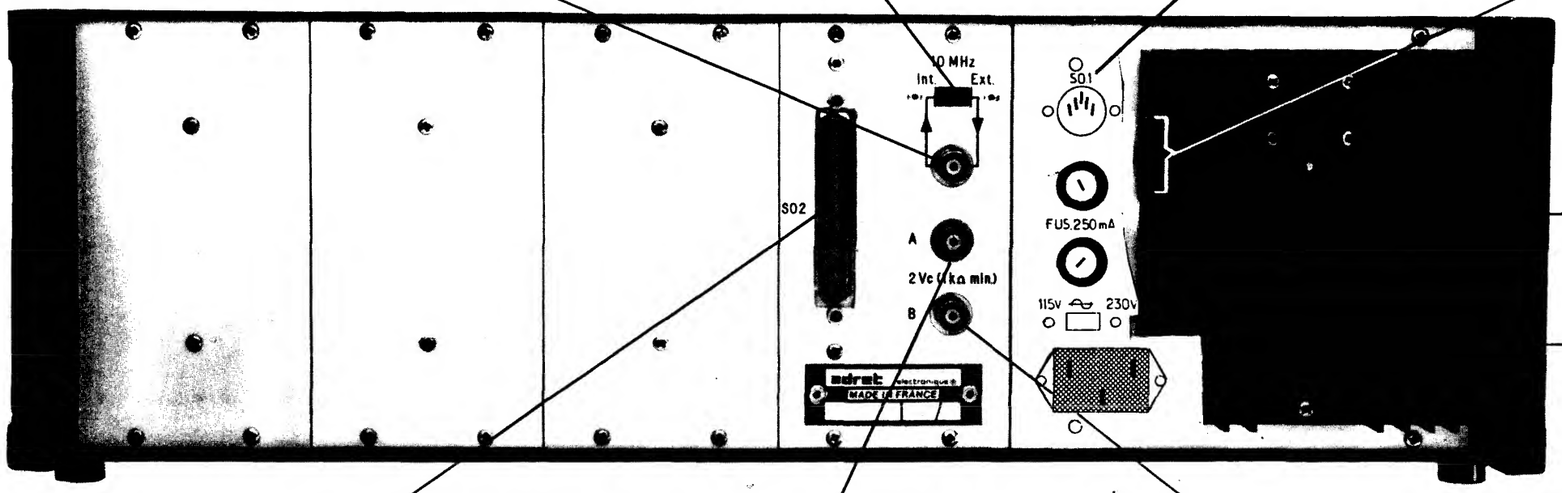
DIN connector providing + 12 V, + 6 V and − 12 V regulated voltages.
Maximum current : 20 mA

J5

K10

S01

F1/F2 — 250 mA fuses, independant of AC line voltage.



K9 — AC line voltage selector

S03 — AC line socket

S02

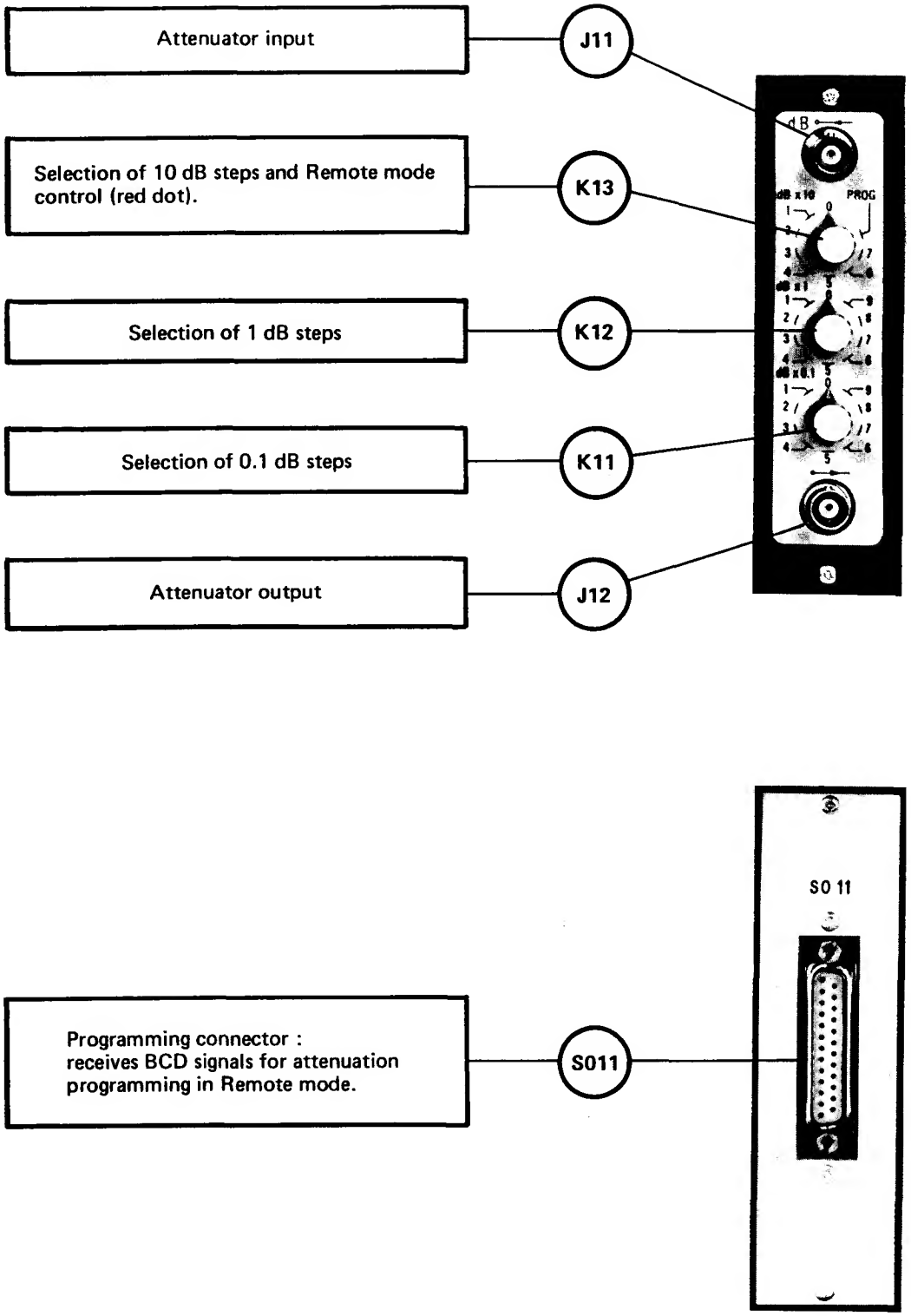
Programming connector :
receives BCD signals for synthesized frequency programming in Remote mode.

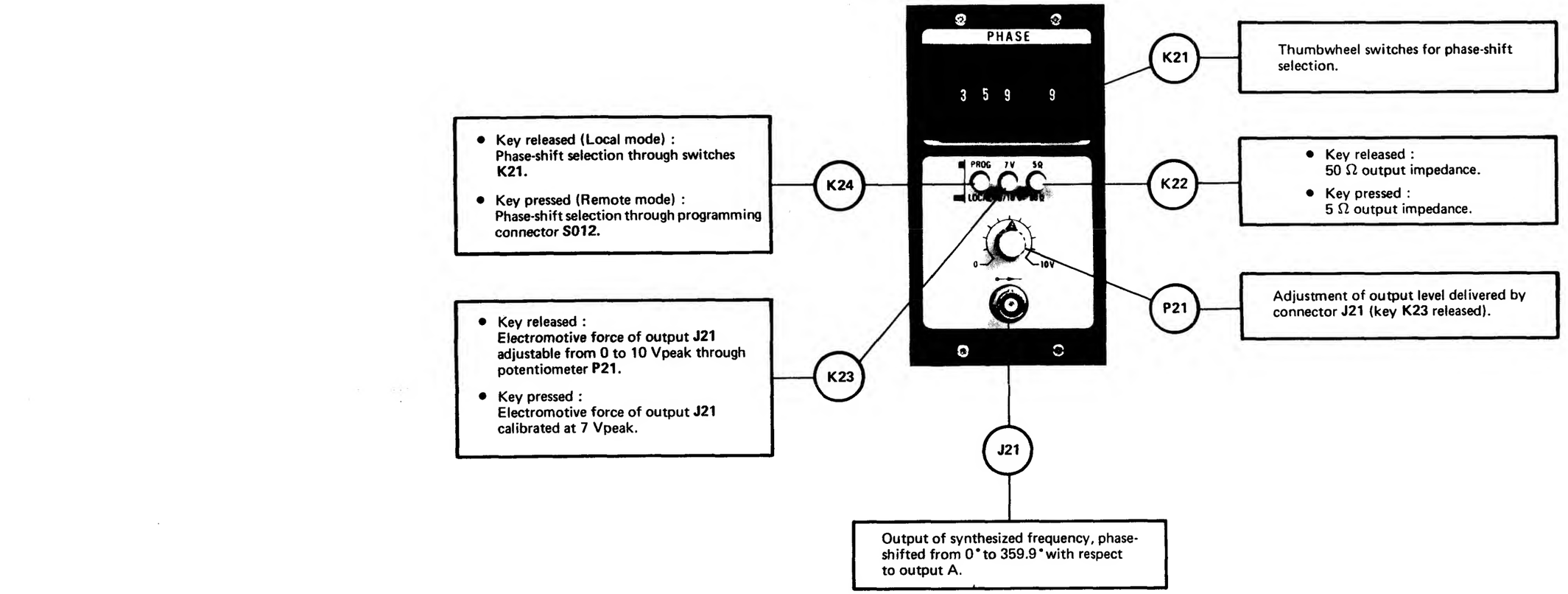
J3

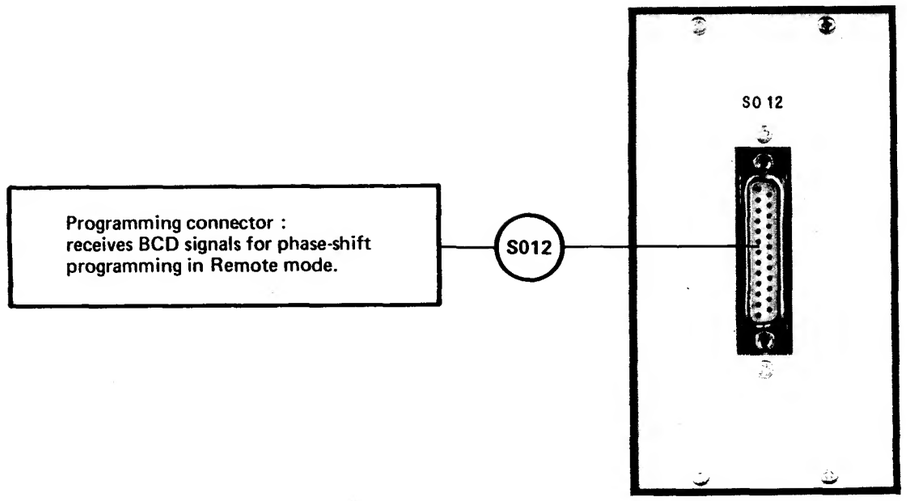
Auxiliary output A
Minimum load impedance : 1 kΩ
Nominal e.m.f. : 2 Vpeak

J4

Auxiliary output B
Minimum load impedance : 1 kΩ
Nominal e.m.f. : 2 Vpeak


Attenuator input
J11
Selection of 10 dB steps and Remote mode control (red dot).
K13
Selection of 1 dB steps
K12
Selection of 0.1 dB steps
K11
Attenuator output
J12
dB
dB x10
PROG
dB x1
dB x0.1
S0 11
Programming connector :
receives BCD signals for attenuation programming in Remote mode.
S011


PHASE
3 5 9 9
PROG
7V
50
0
10V
K21
Thumbwheel switches for phase-shift selection.
K22
• Key released : 50 Ω output impedance.
• Key pressed : 5 Ω output impedance.
P21
Adjustment of output level delivered by connector J21 (key K23 released).
K24
• Key released (Local mode) : Phase-shift selection through switches K21.
• Key pressed (Remote mode) : Phase-shift selection through programming connector S012.
K23
• Key released : Electromotive force of output J21 adjustable from 0 to 10 Vpeak through potentiometer P21.
• Key pressed : Electromotive force of output J21 calibrated at 7 Vpeak.
J21
Output of synthesized frequency, phase-shifted from 0° to 359.9° with respect to output A.


S0 12
Programming connector : receives BCD signals for phase-shift programming in Remote mode.
S012

Interpolation oscillator centering.

Operating mode selection.

- All keys released :
  Search function provided by potentiometer **P41.**
- Key ⩘ pressed :
  Triggered sweep by internal sawtooth.
  Sweep duration controlled by switch **K45.**
  Sawtooth start and stop controlled by **K42** and **K43,** or **J46** and **J47.**
- Key ⩘ pressed :
  Free-run sweep by internal triangles.
  Sweep duration controlled by switch **K45.**
- Key **Ext.** pressed :
  Sweep by external signal applied to connector **J41.**

Display of **P41** potentiometer setting.

- Search function :
  Continuous adjustment of synthesizer output frequency.
- Free-run and Triggered modes :
  Adjustment of center frequency around which the sweep is performed.

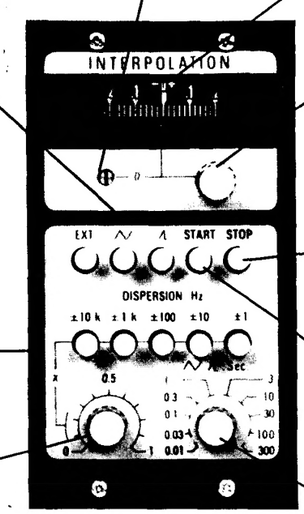
Pressing this key stops the sawtooth (Triggered mode).

Pressing this key starts the sawtooth (Triggered mode).

Sweep time selection

Dispersion range selection (± 1 Hz to ± 10 kHz)

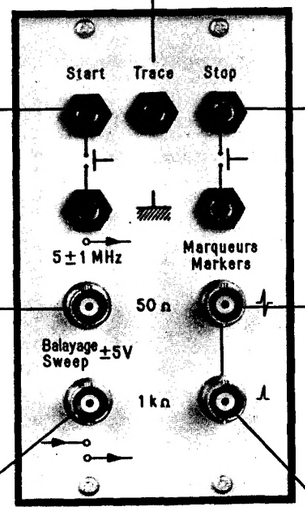
Continuous adjustment of dispersion.



P43 · DS41 · P41 · K41 · K43 · K42 · K45 · K44 · P42

Trace output :
presents a low impedance as the sweep signal rises.
(Free-run and Triggered modes)

J45



Grounding this socket starts the sawtooth (Triggered mode). — J46

Grounding this socket stops the sawtooth (Triggered mode). — J47

5 MHz ± 1 MHz output representing the output frequency interpolation.
Level : 200 mVrms/50 Ω approximately — J42

Birdy markers output.
Marker spacing : 10 % of dispersion range. — J44

- External mode :
  Sweep signal input (10 kΩ input impedance).
- Free-run and Triggered modes :
  Sweep signal output (minimum load 1 kΩ)

J41

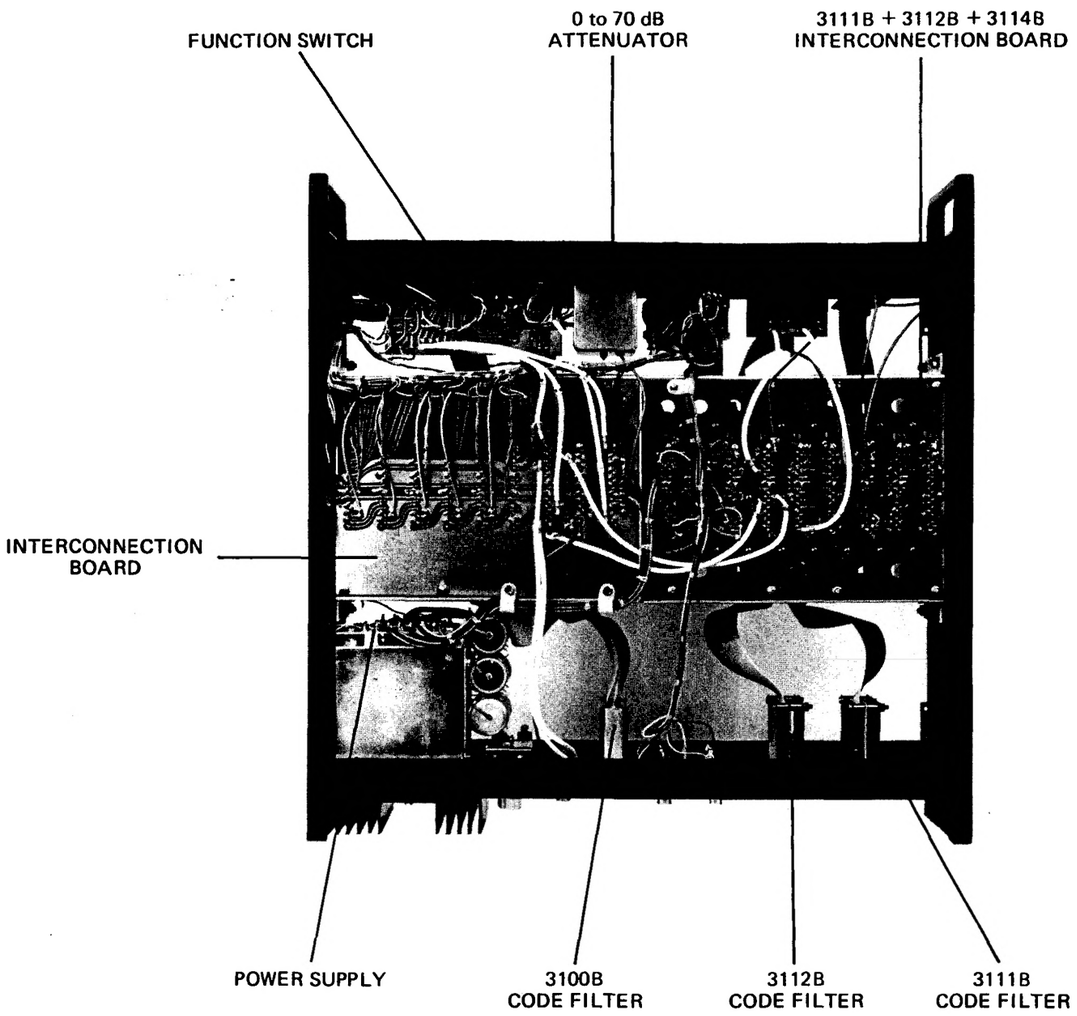
J43

Rectified markers output.
Marker spacing : 10 % of dispersion range.
Minimum load impedance : 1 kΩ.

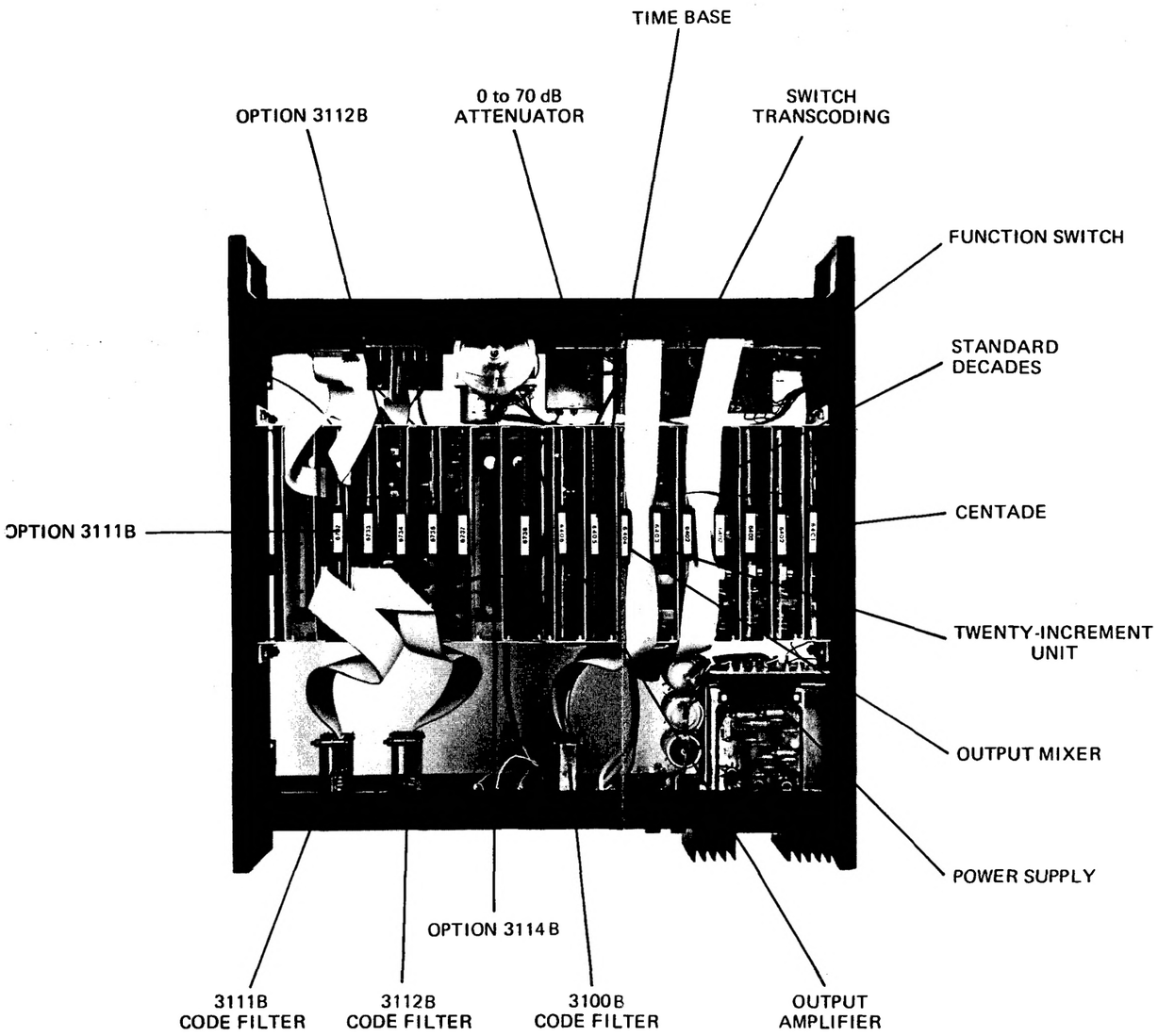
OPTION 3114B. FRONT AND REAR-PANEL DESCRIPTION

PLATE V-5

BOTTOM VIEW



TOP VIEW



F12 : 2.1MHz to 1.9MHz from INTERPOLATION (option 3114)

FL1 (1,9 / 2,1MHz) F1 — D2 (1/10) — DP1 (2000 to 1901 / 1) — 10 kHz — CP1 (CPF) — 10kHz — D1 (1/10) — CENTADE — A1

FL3 (1,9 / 2,1MHz) F2 — D3 (1/10) — A3 — FL2 (19 / 20MHz) — M1 — O2 18 / 17,1MHz — DP2 (180 to 171 / 1) 10^0Hz — 100 kHz — CP2 (CPF) — 100kHz — STANDARD DECADE — A2

FL3 (1,9 / 2,1MHz) F3 — D3 (1/10) — A3 — FL2 (19 / 20MHz) — M1 — O2 18 / 17,1MHz — DP2 (180 to 171 / 1) 10^1Hz — 100 kHz — CP2 (CPF) — 100kHz — STANDARD DECADE — A2

FL3 (1,9 / 2,1MHz) F4 — D3 (1/10) — A3 — FL2 (19 / 20MHz) — M1 — O2 18 / 17,1MHz — DP2 (180 to 171 / 1) 10^2Hz — 100 kHz — CP2 (CPF) — 100kHz — STANDARD DECADE — A2

FL3 (1,9 / 2,1 MHz) F5 — D3 (1/10) — A3 — FL2 (19 / 20MHz) — M1 — O2 18 / 17,1MHz — DP2 (180 to 171 / 1) 10^3Hz — 100 kHz — CP2 (CPF) — 100kHz — STANDARD DECADE — A2

A5 — D6 (5/1) — CPF — D7 (2/1)

O4 8 / 7,2 MHz — A6 — F6

M2 — FL5 (0,7 / 1,3MHz) — FL4 (6,4 / 7,2 MHz) — O3 7,2 / 6, 44MHz — DP3 (180 to 161 / 1) 10^4Hz 10^5Hz — 40kHz — CP3 (CPF) — 40kHz — D5 (1/5) — D4 (2/1) — A4

TWENTY INCREMENT UNIT

F9 : 100kHz

F10 : 200kHz

F7 : 0 to 199.999 99 kHz

J3 2Vpeak — to options — J4 2Vpeak

F8 : 0 to 199.999 99 kHz

A9 — FL5 (200kHz) — 0° — M3

A7 — D8 (4/1) — 90° — M4

A10 — FL6 (200kHz)

FL7 (2MHz) — A8

OUTPUT MIXER

FUNCTION SWITCH

K6

OUTPUT AMPLIFIER

A12 — A11

K5 — 0 to 70 dB ATTENUATOR — K8

Output B 0 to 10 Vpeak J2

Output A 0 to 10 Vpeak J1

TIME BASE

O5 10MHz — K10 — D9 (5/1) — D10 (1/10)

F11 : 2MHz

J5 10MHz Input/Output

F13 : 10MHz to INTERPOLATION (option 3114)

FREQUENCY LAYOUT (WITHOUT SEARCH FUNCTION)

F1 : 2MHz to 1,901MHz
F2 : 2MHz to 1,9001MHz
F3 : 2MHz to 1,900 01MHz
F4 : 2 MHz to 1,900 001MHz
F5 : 2 MHz to 1,900 000 1MHz
F6 : 8 MHz to 7,200 000 04MHz
F7 : 0,01Hz to 199,999 99 kHz
F8 : 0,01Hz to 199, 999 99 kHz

PLATE VI.1
3100 B BLOCK DIAGRAM

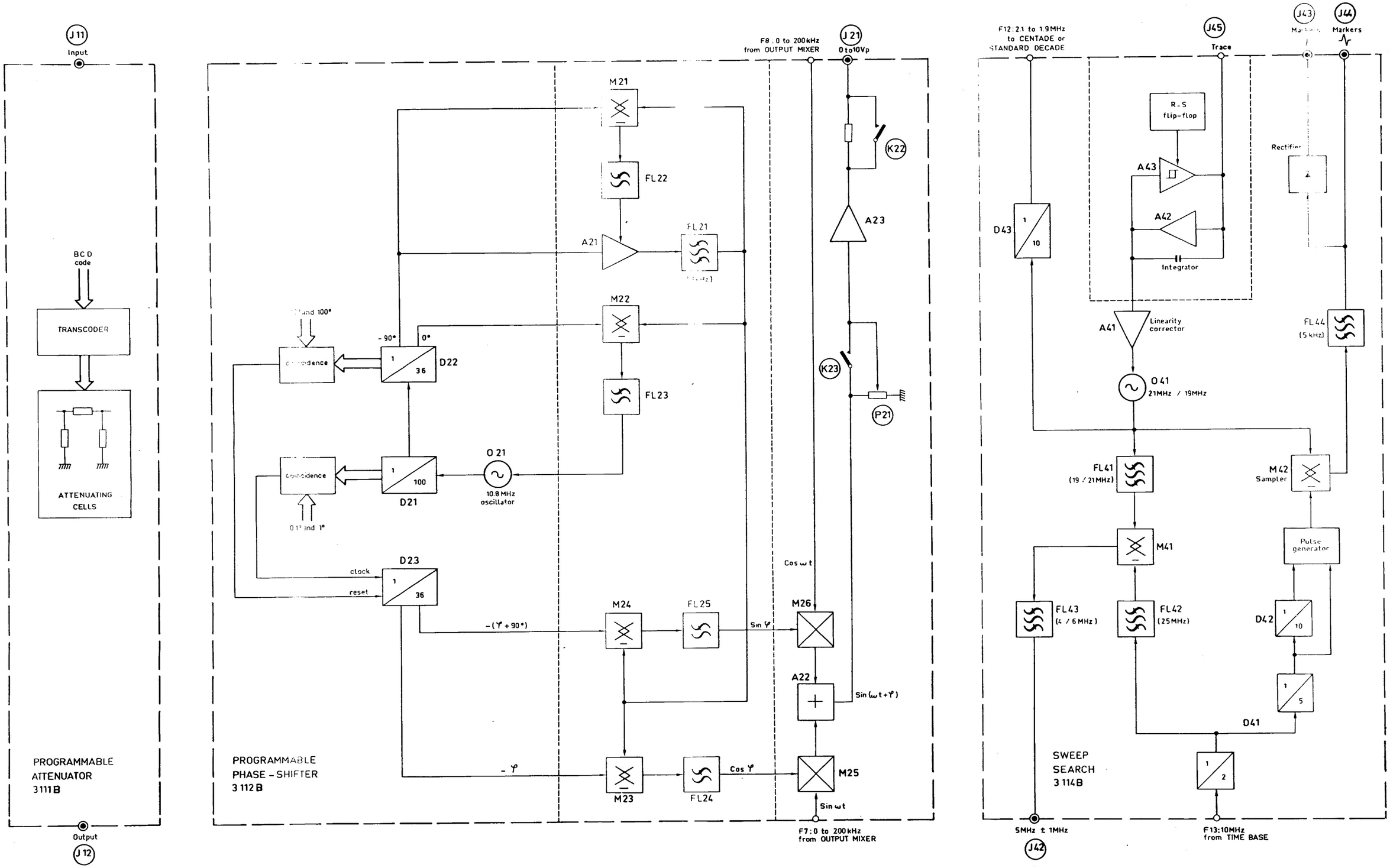


PLATE VI-2

3111B - 3112B - 3114B BLOCK DIAGRAM